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(54) Title: COSMETIC COMPOSITIONS CONTAINING VITAMIN B3

(57) Abstract: According to the present invention there is provided a cosmetic composition comprising: (a) at least one quaternary ammonium agent said agent having a transition temperature of less than 50 °C; and (b) at least one thermosensitive skin benefit agent. The compositions of the present invention give good skin care benefits, such as good moisturisation, good hydration, good skin feel, good skin softness and/or good skin smoothness, with low levels of negatives and are easier to process.

COSMETIC COMPOSITIONS CONTAINING VITAMIN B3

Technical Field

The present invention relates to cosmetic compositions. In particular, the present invention relates to cosmetic compositions that provide good moisturisation, hydration, skin feel, skin softness and/or skin smoothness benefits.

Background to the Invention

Skin is made up of several layers of cells which coat and protect the keratin and collagen fibrous proteins that form the skeleton of its structure. The outermost of these layers, referred to as the stratum corneum, is known to be composed of 25nm protein bundles surrounded by 8nm thick layers. Anionic surfactants and organic solvents typically penetrate the stratum corneum membrane and, by delipidization (i.e. removal of the lipids from the stratum corneum), destroy its integrity. This destruction of the skin surface topography leads to a rough feel and may eventually permit the surfactant or solvent to interact with the keratin, creating irritation. Many people expose their skin to this type of insult every day. In addition, the skin can be damaged by other factors such as exposure to cold air or wind, mechanical abrasion, immersion in water etc. Thus, there exists a need for a way of mitigating or ameliorating this damage.

In the past compositions have been formulated that are claimed to assist the stratum corneum in maintaining its barrier and water-retention functions at optimum performance in spite of deleterious interactions which the skin may encounter in washing, work, and recreation. Desirable properties for such compositions are that they have good skin feel, water retention, moisturisation, absorption, and/or rub-in characteristics. Prior art compositions have attempted to deliver these properties by the use of one or more 'skin benefit agents'. However, some of these benefit agents are sensitive to elevated temperatures and can, therefore, be difficult to process. For example, one way of delivering

high moisturisation to the skin is to incorporate urea into a composition. Other benefits can be garnered from incorporating salicylic acid. Both of these materials are thermosensitive and, consequently, are difficult to process.

Quaternary ammonium agents are also known for use in cosmetic compositions. See, for example, WO-A-99/27904, WO-A-96/32089, and EP-A-789,076. Also, US-A-5,804,205 which discloses skin care compositions which are claimed to provide a high degree of moisturisation without leaving a "tacky" or "sticky" residue. The compositions contain quaternary ammonium compounds having two alkyl groups of 16-22 carbon atoms, humectant and non-irritating hydrophobic microspheres having an average particle size of less than 50 μm. It is claimed that the hydrophobic polymeric microspheres significantly reduce the "tackiness" associated with high humectant levels. However, some quaternary ammonium agents have a high melting temperature and so can be difficult to formulate with the above mentioned thermosensitive skin benefit agents.

It has now been unexpectedly found that compositions comprising at least one quaternary ammonium agent having a transition temperature of less than 50°C and at least one thermosensitive skin benefit agent provide high levels of the associated benefits such as moisturisation, hydration, skin feel, skin softness or skin smoothness, but show low levels of the associated negatives and are easier to process.

While not wishing to be bound by theory, it is believed that the quaternary ammonium agents of the present invention can vesiculate the thermosensitive skin benefit agents at a temperature which does not lead to decomposition of said benefit agents and drive their deposition onto the skin. This results in a smooth and uniform application of the thermosensitive skin benefit agent to the skin with reduced negatives such as tack/stickiness/greasiness. Also, it is believed that the quaternary ammonium agents help reduce the loss of thermosensitive skin benefit agents from the skin due to environmental factors such as water or abrasion. Moreover, it is believed that the quaternary ammonium agents themselves deliver skin care benefits, such as good moisturisation, good skin feel, good skin softness.

Summary of th Invention

According to the present invention there is provided a cosmetic composition comprising:

(a) at least one quaternary ammonium agent said agent having a transition temperature of less than 50°C; and

(b) at least one thermosensitive skin benefit agent.

The compositions of the present invention give good skin care benefits, such as good moisturisation, good hydration, good skin feel, good skin softness and/or good skin smoothness, with low levels of negatives and are easier to process.

Detailed Description of the Invention

The compositions of the present invention comprise at least one quaternary ammonium agent having a transition temperature of less than 50°C and at least one thermosensitive skin benefit agent. These elements will be described in more detail below.

The present compositions can be used for any suitable purpose. In particular, the present compositions are suitable for topical application to the skin. In particular, the skin care compositions can be in the form of creams, lotions, gels, and the like. Preferably the cosmetic compositions herein are in the form of an oil-in-water emulsion of one or more oil phases in an aqueous continuous phase, each oil phase comprising a single oily component or a mixture of oily components in miscible or homogeneous form but said different oil phases containing different materials or combinations of materials from each other.

The compositions of the present invention preferably comprise vesicles. Preferably said vesicles comprise the quaternary ammonium compound together with thermosensitive skin benefit agent. As used herein the term "vesicle" means one or more bilayers arranged in a closed, usually spherical geometry, said bilayer comprises quaternary ammonium agent as described hereinbelow.

Preferably the compositions of the present invention comprise less than 10%, preferably less than 5%, more preferably less than 3%, even more preferably 0%, by weight, of anionic surfactant.

The compositions of the present invention are preferably formulated so as to have a product viscosity of at least about 1,000 mPa.s and preferably in the range from about 1,000 to about 300,000 mPa.s, more preferably from about 2,500 to about 250,000 mPa.s and especially from about 5,000 to about 200,000 mPa.s (26.8°C, neat, Brookfield DV-II+ Spindle CP52/CP41).

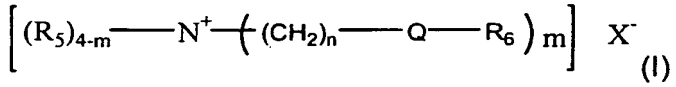
Quaternary Ammonium Agent

The compositions of the present invention must comprise at least one quaternary ammonium agent having a transition temperature of less than 50°C. Any quaternary ammonium agent suitable for use in cosmetic compositions may be used herein. As used herein the term "quaternary ammonium agent" means a compound or mixture of compounds having a quaternary nitrogen atom substituted with one or more, preferably two, moieties containing six or more carbon atoms. As used herein the term "transition temperature" means the temperature at which the quaternary ammonium agent transitions from one phase to another. Transition temperature can be measured using differential scanning calorimetry techniques (DSC) which are well-known to the person skilled in the art. In the present invention, the relevant transition temperature is the temperature at which the quaternary ammonium agents pass from a tightly ordered "gel" or "solid" phase, to a liquid-crystal phase where the freedom of movement of individual molecules is higher and vesicle formation can occur. Preferably the quaternary ammonium agents for use herein are selected from those having a quaternary nitrogen substituted with two moieties wherein each moiety comprises ten or more, preferably 12 or more, carbon atoms. Highly preferred quaternary ammonium agents for use herein are selected from those which are able to form vesicles in polar solvents, as detected by microscopic analysis (polarised light microscopy at a magnification of x60 using a Nikon Eclipse E800 microscope).

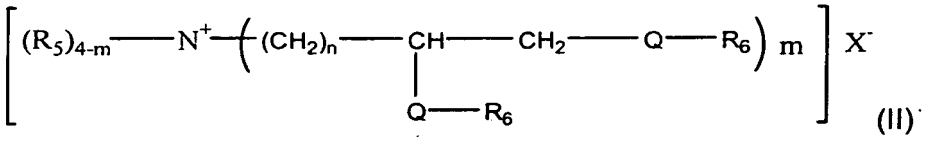
Preferably the present compositions comprise at least 0.01%, more preferably at least 0.1%, even more preferably at least 1%, still more preferably at least 3%, by weight, of quaternary ammonium agent.

Preferably the quaternary ammonium agents for use herein are selected from:

(a) quaternary ammonium compounds according to general formula (I) or (II):

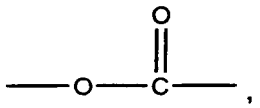


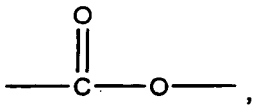
(I)

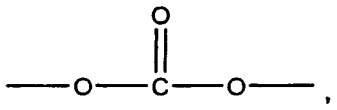


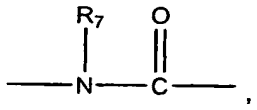
(II)

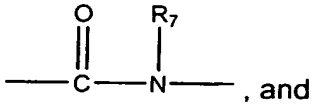
wherein, each R_5 unit is independently selected from hydrogen, branched or straight chain C_1-C_6 alkyl, branched or straight chain C_1-C_6 hydroxyalkyl and mixtures thereof, preferably methyl and hydroxyethyl; each R_6 unit is independently linear or branched C_{11}-C_{22} alkyl, linear or branched C_{11}-C_{22} alkenyl, and mixtures thereof; X^- is an anion which is compatible with skin care actives and adjunct ingredients; m is from 1 to 4, preferably 2; n is from 1 to 4, preferably 2 and Q is a carbonyl unit selected from:

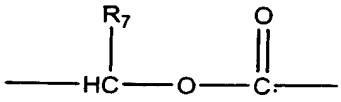









, and

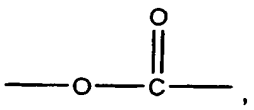


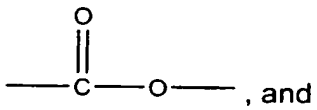
wherein R_7 is hydrogen, C_1-C_4 alkyl, C_1-C_4 hydroxyalkyl, and mixtures thereof.

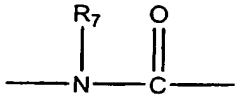
In the above quaternary ammonium compound example, the unit -QR_6 contains a fatty acyl unit which is typically derived from a triglyceride source. The triglyceride source is preferably derived from tallow, partially hydrogenated tallow, lard, partially hydrogenated lard, vegetable oils and/or partially hydrogenated vegetable oils, such as, canola oil, safflower oil, peanut oil, rapeseed oil, sunflower oil, corn oil, soybean oil, tall oil, rice bran oil, etc. and mixtures of these oils.

The counterion, X^- in the above compounds, can be any compatible anion, preferably the anion of a strong acid, for example, chloride, bromide, methylsulfate, ethylsulfate, sulfate, nitrate and the like, more preferably chloride or methyl sulfate. The anion can also, but less preferably, carry a double charge in which case X^- represents half a group.

The preferred quaternary ammonium compounds of the present invention are the diester and/or diamide Quaternary Ammonium (DEQA) compounds, the diesters and diamides having general formula (II), wherein the carbonyl group Q is selected from:





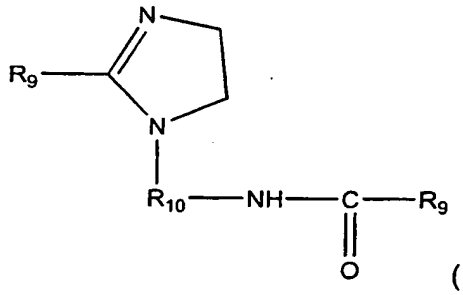


Tallow, canola and palm oil are convenient and inexpensive sources of fatty acyl units which are suitable for use in the present invention as R_6 units.

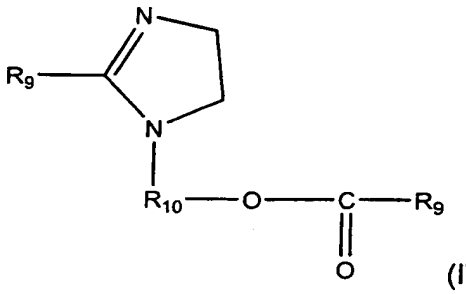
The counterion, X^-, can be chloride, bromide, methylsulfate, formate, sulfate, nitrate, and mixtures thereof. In fact, the anion, X, is merely present as a counterion of the positively charged quaternary ammonium compounds. The scope of this invention is not considered limited to any particular anion.

As used herein, when the diester is specified, it will include the monoester and triester that are normally present as a result of the manufacture process.

(b) quaternary ammonium compounds according to general formula (III) or (IV):



(III)

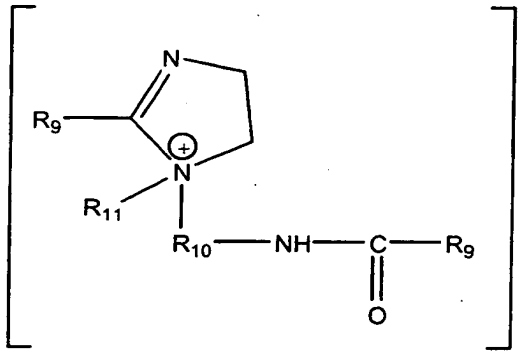


(IV)

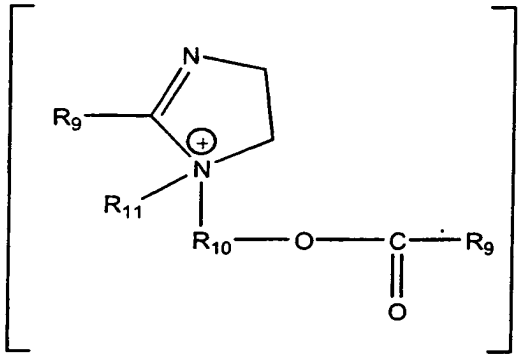
wherein R_9 is an acyclic aliphatic C_{15}-C_{21} hydrocarbon group and R_{10} is a C_1-C_6 alkyl or alkylene group.

These ammonium compounds, having a pKa value of not greater than about 4, are able to generate a cationic charge in situ when dispersed in an aqueous solution, providing that the pH of the final composition is not greater than about 6.

(c) quaternary ammonium compounds according to general formula (V) or (VI):



(V)



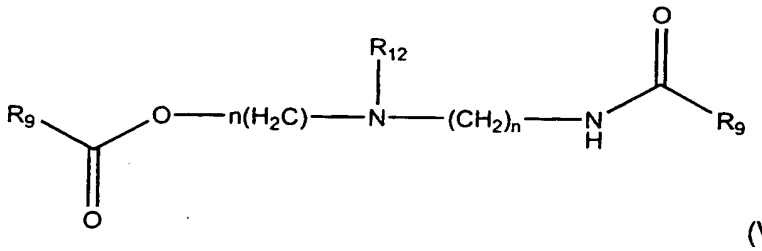
(VI)

wherein R_9 & R_{10} are as specified hereinabove and R_{11} is selected from C_1-C_4 alkyl and hydroxyalkyl groups.

The counterion, X^-, can be chloride, bromide, methylsulfate, formate, sulfate, nitrate, and mixtures thereof. In fact, the anion, X, is merely present as a

counterion of the positively charged quaternary ammonium compounds. The scope of this invention is not considered limited to any particular anion.

(d) quaternary ammonium compounds according to general formula (VII) or (VIII):



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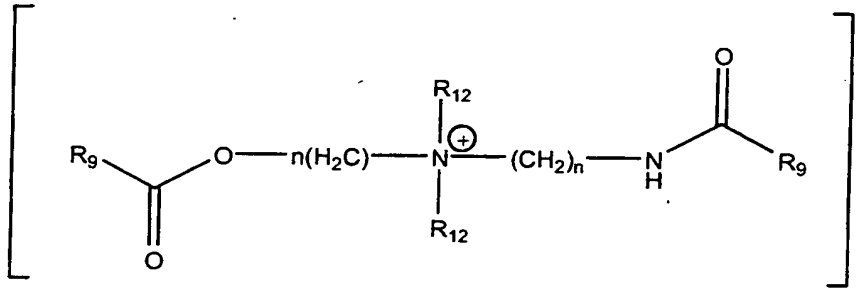


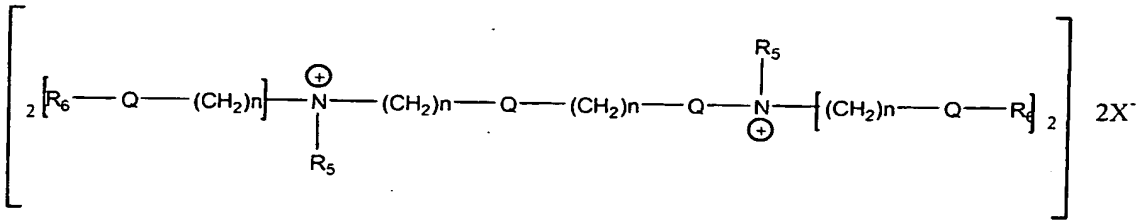
(VIII)

wherein, n is from 1 to 6, R_9 is selected from acyclic aliphatic C_{15}-C_{21} hydrocarbon groups and R_{12} is selected from C_1-C_4 alkyl and hydroxyalkyl groups.

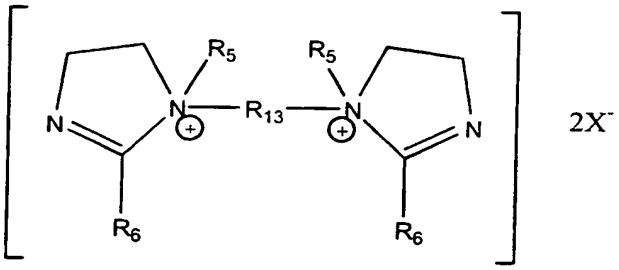
These ammonium compounds, having a pKa value of not greater than about 4, are able to generate a cationic charge in situ when dispersed in an aqueous solution, providing that the pH of the final composition is not greater than about 6.

The counterion, X^-, can be chloride, bromide, methylsulfate, formate, sulfate, nitarte, and mixtures thereof. In fact, the anion, X, is merely present as a counterion of the positively charged quaternary ammonium compounds. The scope of this invention is not considered limited to any particular anion.

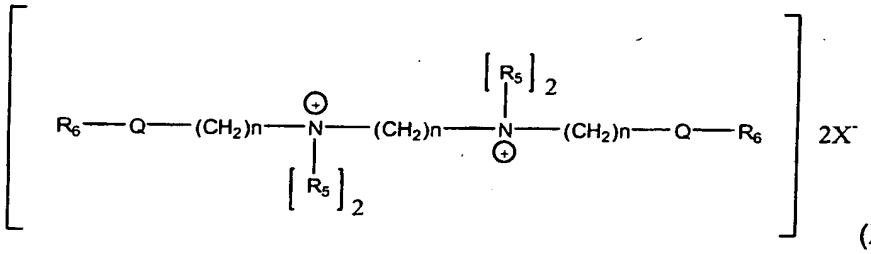
(e) diquaternary ammonium compounds according to general formula (X), (XI), (XII) or (XIII):



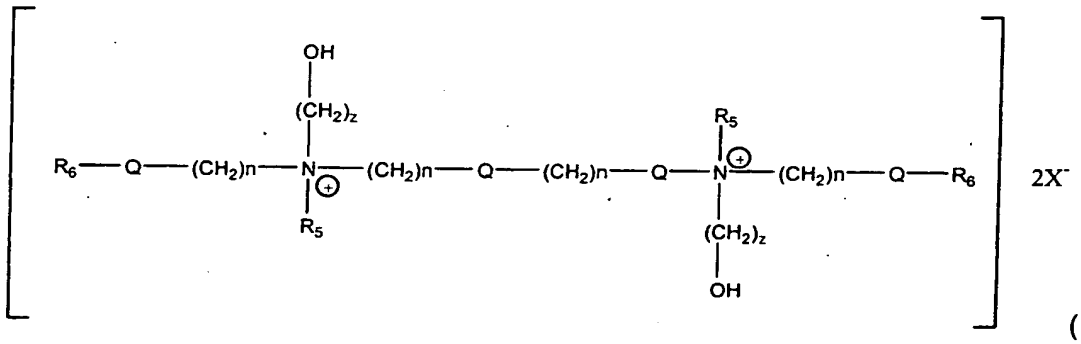
(X)



(XI)



(XII)

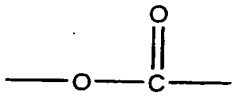


(XIII)

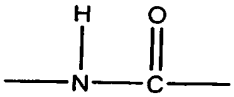
wherein R_5, R_6, Q, n & X^- are as defined hereinabove in relation to general formula (II) and (III), R_{13} is selected from C_1-C_6 alkylene groups, preferably an ethylene group and z is from 0 to 4.

(f) mixtures of the above quaternary ammonium compounds.

The preferred quaternary ammonium agents for use in the present invention are those described in section (b) hereinabove. In particular, diester and/or diamide quaternary ammonium (DEQA) compounds according to general formula (II) hereinabove are preferred. Preferred diesters for use herein are those according to general formula (II) wherein R_5, R_6, and X^- are as defined hereinabove and Q is:



Preferred diamides for use herein are those according to general formula (II) wherein R_5, R_6, and X^- are as defined hereinabove and Q is:



Preferred examples of quaternary ammonium compounds suitable for use in the compositions of the present invention are N,N-di(canolyl-oxy-ethyl)-N,N-dimethyl ammonium chloride, N,N- di(canolyl-oxy-ethyl)-N-methyl,N-(2-hydroxyethyl) ammonium methyl sulfate, N,N-di(canolyl-oxy-ethyl)-N-methyl, N-(2-hydroxyethyl) ammonium chloride and mixtures thereof. Particularly preferred for use herein is N,N-di(canolyl-oxy-ethyl)-N-methyl,N-(2-hydroxyethyl) ammonium methyl sulfate.

Although quaternary ammonium compounds are derived from "canolyl" fatty acyl groups are preferred, other suitable examples of quaternary ammonium compounds are derived from fatty acyl groups wherein the term "canolyl" in the above examples is replaced by the terms "tallowyl, cocoyl, palmyl, lauryl, oleyl,

ricinoleyl, stearyl, palmityl" which correspond to the triglyceride source from which the fatty acyl units are derived. These alternative fatty acyl sources can comprise either fully saturated, or preferably at least partly unsaturated chains.

Thermosensitive Skin Benefit Agents

A second essential element of the compositions of the present invention is that they comprise at least one thermosensitive skin benefit agent. As used herein the term "thermosensitive skin benefit agent" means any compound or mixture of compounds which begins to decompose when heated to above 50°C. Any thermosensitive skin benefit agent may be used herein provided it is compatible for use in cosmetic compositions. Preferably, the compositions of the present invention comprise at least 0.01%, more preferably at least about 0.1%, even more preferably at least about 0.5%, by weight of thermosensitive skin benefit agent.

Preferred thermosensitive skin benefit agents include thermosensitive vitamins: such as vitamin A and derivatives, tocopherol, β-carotene, vitamin D_3; thermosensitive plant oils such as those with a high content of poly-unsaturated fatty acids e.g. wheat germ oil, sunflower oil, grape seed oil, soybean oil, evening primrose oil; thermosensitive plant extracts such as calendula extract, Ivy extract, algae extracts; thermosensitive proteins such as hydrolysed collagen, hydrolysed elastin, hydrolysed wheat protein, proteoglycan; volatiles such as low viscosity dimethicone, cyclomethicone, isododecane, isopropanol; phospholipids such as lecithin; sunfilters such as phenyl benzimidazole sulfonic acid (Eusolex 232), benzophenone-2, benophenone-4, benzophenone-6; peroxides: like benzoyl peroxide and hydrogen peroxide; thermosensitive antibacterials such as tetracycline, doxycycline, chlortetracycline, oxytetracycline, minocycline, tetracycline HCL, doxycycline HCL, Triclosan and triclocarbanilide; bisabolol; dihydroxyacetone; salicylic acid; propylene glycols; urea; and mixtures thereof.

More preferred thermosensitive skin benefit agents for use in the present compositions are selected from vitamin A and derivatives; salicylic acid; tocopherol, β-carotene, vitamin D_3; urea and mixtures thereof.

Optional Ingredi nts

The compositions herein can contain a variety of optional components suitable for rendering the present compositions more cosmetically or aesthetically acceptable or to provide them with additional usage benefits. Such conventional optional ingredients are well-known to those skilled in the art. These include any cosmetically acceptable ingredients such as those found in the *CTFA International Cosmetic Ingredient Dictionary and Handbook, 7th edition, edited by Wenninger and McEwen, (The Cosmetic, Toiletry, and Fragrance Association, Inc., Washington, D.C., 1997).* Some non-limiting examples of these optional ingredients are given below.

Skin Benefit Agent

It is highly preferred that the compositions of the present invention comprise a skin benefit agent. As used herein the term "skin benefit agent" means any compound or mixture of compounds which, for example, gives moisturisation, protection, skin feel, skin softness and/or skin smoothness benefits to the skin. Preferred skin benefit agents for use herein are humectants, emollients and mixtures thereof. Preferably the compositions of the present invention comprise humectants and emollients.

Preferably the compositions of the present invention comprise at least 1% by weight of skin benefit agent. More preferably the present compositions comprise from 2% to 70%, preferably 5% to 60%, even more preferably 10% to 55%, by weight of skin benefit agent.

Humectant

A highly preferred optional ingredient for the compositions of the present invention is humectant. As used herein the term "humectant" means a substance which provides the skin with water-retention benefits. Preferably, the compositions of the present invention comprise at least 1%, more preferably at least 5%, even more preferably at least 10%, even more still preferably at least 20%, by weight of humectant.

Any humectant suitable for use in cosmetic compositions may be used herein. Non-limiting examples of suitable humectants for use in the present invention

are described in WO98/22085, WO98/18444 and WO97/01326. Preferably the humectants for use herein are selected from, but not limited to; amino acids and derivatives thereof such as proline and arginine aspartate, 1,3-butylene glycol, and water and codium tomentosum extract, collagen amino acids or peptides, creatinine, diglycerol, biosaccharide gum-1, glucamine salts, glucuronic acid salts, glutamic acid salts, polyethylene glycol ethers of glycerine (e.g. glycereth 20), glycerine, glycerol monopropoxylate, glycogen, hexylene glycol, honey, and extracts or derivatives thereof, hydrogenated starch hydrolysates, hydrolyzed mucopolysaccharides, inositol, keratin amino acids, urea, LAREX A-200 (available from Larex), glycosaminoglycans, methoxy PEG 10, methyl gluceth-10 and -20 (both commercially available from Amerchol located in Edison, NJ), methyl glucose, 3-methyl-1,3-butanediol, N-acetyl glucosamine salts, polyethylene glycol and derivatives thereof (such as PEG 15 butanediol, PEG 4, PEG 5 pentaerythitol, PEG 6, PEG 8, PEG 9), pentaerythitol, 1,2 pentanediol, PPG-1 glyceryl ether, PPG-9, 2-pyrrolidone-5-carboxylic acid and its salts such as glyceryl pca, saccharide isomerate, SEACARE (available from Secma), sericin, sodium acetylhyaluronate, sodium hyaluronate, sodium poly-aspartate, sodium polyglutamate, sorbeth 20, sorbeth 6, sugar and sugar alcohols and derivatives thereof such as glucose, mannose and polyglycerol sorbitol, trehalose, triglycerol, trimethyolpropane, tris (hydroxymethyl) amino methane salts, and yeast extract, and mixtures thereof.

More preferably, the humectants for use herein are selected from glycerine, butylene glycol, and derivatives thereof, or mixtures thereof. Even more preferably, the humectant for use herein is glycerine.

Emollients

Another highly preferred optional ingredient of the compositions of the present invention is emollient. Emollients tend to lubricate the skin, increase the smoothness and suppleness of the skin, prevent or relieve dryness of the skin, and/or protect the skin. A wide variety of suitable emollients are known and may be used herein. *Sagarin, Cosmetics, Science and Technology, 2nd Edition, Vol. 1, pp. 32-43 (1972)* contains numerous examples of materials suitable for use as emollients. Preferably the compositions of the present invention comprise

greater than 1%, more preferably at least 5%, even more preferably at least 10%, by weight, of emollient.

Preferably the emollients for use herein are selected from:

i) Straight and branched chain hydrocarbons having from about 7 to about 40 carbon atoms, such as dodecane, squalane, petrolatum, cholesterol and derivatives thereof, hydrogenated polyisobutylene, isohexadecane and the C_7-C_{40} isoparaffins, which are C_7-C_{40} branched hydrocarbons.

ii) C_1-C_{30} alcohol esters of C_1-C_{30} carboxylic acids and of C_2-C_{30} dicarboxylic acids, e.g. isononyl isononanoate, isopropyl myristate, myristyl propionate, isopropyl stearate, behenyl behenate, dioctyl maleate, diisopropyl adipate, and diisopropyl dilinoleate.

iii) mono-, di- and tri- glycerides of C_1-C_{30} carboxylic acids and ethoxylated derivatives thereof. Suitable polyethylene glycol derivatives of glycerides include PEG-20 almond glycerides, PEG-60 almond glycerides, PEG-11 avocado glycerides, PEG-6 capric/caprylic glycerides, PEG-8 capric/caprylic glycerides, PEG-20 corn glycerides, PEG-60 corn glycerides, PEG-60 evening primose glycerides, PEG-7 glyceryl cocoate, PEG-30 glyceryl cocoate, PEG-40 glyceryl cocoate, PEG-78 glyceryl cocoate, PEG-80 glyceryl cocoate, PEG-12 glyceryl dioleate, PEG-15 glyceryl isostearate, PEG-20 glyceryl isostearate, PEG-30 glyceryl isostearate, PEG-75 cocoa butter glycerides, PEG-20 hydrogenated palm oil glycerides, PEG-70 mango glycerides, PEG-13 mink glycerides, PEG-75 shorea butter glycerides, PEG-10 olive glycerides, PEG-12 palm kernal glycerides, PEG-45 palm kernal glycerides, PEG-8 glyceryl laurate and PEG-30 glyceryl laurate. Mixtures of polyethylene glycol derivatives of glycerides can also be used herein.

iv) alkylene glycol esters of C_1-C_{30} carboxylic acids, e.g. ethylene glycol mono- and di- esters, and propylene glycol mono- and di- esters of C_1-C_{30} carboxylic acids e.g., ethylene glycol distearate.

v) Organopolysiloxane oils. The organopolysiloxane oil may be volatile, non-volatile, or a mixture of volatile and non-volatile silicones. The term "non-volatile" as used in this context refers to those silicones that are liquid under ambient conditions and have a flash point (under one atmospheric of pressure) of or greater than about 100°C. The term "volatile" as used in this context refers to all other silicone oils. Suitable organopolysiloxanes can be

selected from a wide variety of silicones spanning a broad range of volatilities and viscosities. Non-volatile polysiloxanes are preferred. Suitable silicones are disclosed in U.S. Patent No. 5,069,897, issued December 3, 1991. Preferred for use herein are organopolysiloxanes selected from polyalkylsiloxanes, alkyl substituted dimethicones, dimethiconols, polyalkylaryl siloxanes, and mixtures thereof. More preferred for use herein are polyalkylsiloxanes and cyclomethicones. Preferred among the polyalkylsiloxanes are dimethicones.

vi) Vegetable oils and hydrogenated vegetable oils. Examples of vegetable oils and hydrogenated vegetable oils include safflower oil, castor oil, coconut oil, cottonseed oil, menhaden oil, palm kernel oil, palm oil, peanut oil, soybean oil, rapeseed oil, linseed oil, rice bran oil, pine oil, sesame oil, sunflower seed oil, partially and fully hydrogenated oils from the foregoing sources, and mixtures thereof.

vii) animal fats and oils, e.g. cod liver oil, lanolin and derivatives thereof such as acetylated lanolin and isopropyl lanolate. Lanolin oil is preferred.

viii) Also useful are C_4-C_{20} alkyl ethers of polypropylene glycols, C_1-C_{20} carboxylic acid esters of polypropylene glycols, and di- C_8-C_{30} alkyl ethers, examples of which include PPG-14 butyl ether, PPG-15 stearyl ether, dioctyl ether, dodecyl octyl ether, and mixtures thereof.

ix) polyol carboxylic acid esters.

x) mixtures of the above.

Preferred emollients for use in the compositions herein are selected from dodecane, squalane, cholesterol and derivatives thereof, isohexadecane, isononyl isononanoate, petrolatum, lanolin and derivatives thereof, safflower oil, castor oil, coconut oil, cottonseed oil, palm kernel oil, palm oil, peanut oil, soybean oil, polyol carboxylic acid esters and mixtures thereof. More preferred emollients for use herein are selected from polyol carboxylic acid esters, petrolatum and mixtures thereof.

These esters are derived from a sugar or polyol moiety and one or more carboxylic acid moieties. Depending on the constituent acid and sugar, these esters can be in either liquid or solid form at room temperature. Examples of liquid esters include: glucose tetraoleate, the glucose tetraesters of soybean oil

fatty acids (unsaturated), the mannose tetraesters of mixed soybean oil fatty acids, the galactose tetraesters of oleic acid, the arabinose tetraesters of linoleic acid, xylose tetralinoleate, galactose pentaoleate, sorbitol tetraoleate, the sorbitol hexaesters of unsaturated soybean oil fatty acids, xylitol pentaoleate, sucrose tetraoleate, sucrose pentaoletate, sucrose hexaoleate, sucrose hepatoleate, sucrose octaoleate, and mixtures thereof. Examples of solid esters include: sorbitol hexaester in which the carboxylic acid ester moieties are palmitoleate and arachidate in a 1:2 molar ratio; the octaester of raffinose in which the carboxylic acid ester moieties are linoleate and behenate in a 1:3 molar ratio; the heptaester of maltose wherein the esterifying carboxylic acid moieties are sunflower seed oil fatty acids and lignocerate in a 3:4 molar ratio; the octaester of sucrose wherein the esterifying carboxylic acid moieties are oleate and behenate in a 2:6 molar ratio; and the octaester of sucrose wherein the esterifying carboxylic acid moieties are laurate, linoleate and behenate in a 1:3:4 molar ratio. A preferred solid material is sucrose polyester in which the degree of esterification is 7-8, and in which the fatty acid moieties are C18 mono- and/or di-unsaturated and behenic, in a molar ratio of unsaturates: behenic of 1:7 to 3:5. A particularly preferred solid sugar polyester is the octaester of sucrose in which there are about 7 behenic fatty acid moieties and about 1 oleic acid moiety in the molecule. Other materials include cottonseed oil or soybean oil fatty acid esters of sucrose. The ester materials are further described in, U. S. Patent No. 2,831,854, U. S. Patent No. 4,005,196, to Jandacek, issued January 25, 1977; U. S. Patent No. 4,005,195, to Jandacek, issued January 25, 1977, U. S. Patent No. 5,306,516, to Letton et al., issued April 26, 1994; U. S. Patent No. 5,306,515, to Letton et al., issued April 26, 1994; U. S. Patent No. 5,305,514, to Letton et al., issued April 26, 1994; U. S. Patent No. 4,797,300, to Jandacek et al., issued January 10, 1989; U. S. Patent No. 3,963,699, to Rizzi et al, issued June 15, 1976; U. S. Patent No. 4,518,772, to Volpenhein, issued May 21, 1985; and U. S. Patent No. 4,517,360, to Volpenhein, issued May 21, 1985.

The polyol fatty acid polyesters suitable for use herein can be prepared by a variety of methods well known to those skilled in the art. These methods include: transesterification of the polyol with methyl, ethyl or glycerol fatty acid esters using a variety of catalysts; acylation of the polyol with a fatty acid

chloride; acylation of the polyol with a fatty acid anhydride; and acylation of the polyol with a fatty acid, per se. See, for example, U.S. Patent No. 2,831,854; U.S. Patent No. 4,005,196, to Jandacek, issued January 25, 1977.

An especially preferred material is known by the INCI name sucrose polycottonseedate.

Other Skin Benefit Agents

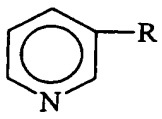
Other skin benefit agents may be useful in the compositions of the present invention. Examples of other skin benefit agents that may be used in the present compositions include:

(a) Vitamin Compounds

Other than those discussed hereinabove, the present compositions may comprise vitamin compounds, precursors, and derivatives thereof. These vitamin compounds may be in either natural or synthetic form. Suitable vitamin compounds include, Vitamin B (e.g., niacin, niacinamide, riboflavin, pantothenic acid, etc.), Vitamin C (e.g., ascorbic acid, etc.), Vitamin D (e.g., ergosterol, ergocalciferol, cholecalciferol, etc.), and Vitamin K (e.g., phytonadione, menadione, phthiocol, etc.) compounds.

Preferred vitamin compounds for use in the compositions of the present invention are vitamin B_3 compounds. Vitamin B_3 compounds are particularly useful for regulating skin condition as described WO-A-97/39733. When present, the compositions of the present invention preferably comprise from about 0.01% to about 50%, more preferably from about 0.1% to about 10%, even more preferably from about 0.5% to about 5%, by weight, of the vitamin B_3 compound.

As used herein, "vitamin B_3 compound" means a compound having the formula:



wherein R is -$CONH_2$ (i.e., niacinamide), -COOH (i.e., nicotinic acid) or -CH_2OH (i.e., nicotinyl alcohol); derivatives thereof; and salts of any of the foregoing.

Exemplary derivatives of the foregoing vitamin B_3 compounds include nicotinic acid esters, including non-vasodilating esters of nicotinic acid, nicotinyl amino acids, nicotinyl alcohol esters of carboxylic acids, nicotinic acid N-oxide and niacinamide N-oxide.

Examples of suitable vitamin B_3 compounds are well known in the art and are commercially available from a number of sources, e.g., the Sigma Chemical Company (St. Louis, MO); ICN Biomedicals, Inc. (Irvin, CA) and Aldrich Chemical Company (Milwaukee, WI).

The vitamin compounds may be included as the substantially pure material, or as an extract obtained by suitable physical and/or chemical isolation from natural (e.g., plant) sources.

Other preferred vitamin compounds include pantothenic acid and/or a pantothenic acid precursor or derivative. Pantothenic acid, which is also known as N-(2,4-dihydroxy-3,3-dimethylbutyryl)-B-alanine, is a member of the B complex vitamins and is sometimes known as vitamin B_5. Pantothenic acid is a dietary essential for most mammals. The material can exist as the D(+) form, the L(-) form, and the racemate. See The Merck Index, Tenth Edition, entry 6877, p. 1007 (1983).

A variety of pantothenic acid precursors or derivatives are known and or can be synthesized. Nonlimiting examples include the alcohol, aldehyde, alcohol esters, acid esters, and the like. Suitable examples are detailed in U.S. Patents 3,230,228; 4,514,338; 4,602,036; 5,136,093; and 5,750,122. Especially preferred for use in the compositions of the instant invention is the alcohol derivative of pantothenic acid. This alcohol, which is also known as panthenol, pantothenol, pantothenyl alcohol, and 2,4-dihydroxy-N-(3-hydroxypropyl)-3,3-dimethylbutanamide is a stable source of pantothenic acid activity. Like the parent acid, panthenol can exist as the D(+) form, the L(-) form, and the racemate. See The Merck Index, Tenth Edition, entry 2910, p. 426 (1983).

The pantothenic acid precursors or derivatives are effective in reducing the irritation caused by vitamin B_3 compounds as a result of individual factors (e.g., hypersensitivity) and/or environmental conditions. With respect to environmental conditions, the irritation reducing compositions of the present invention are preferably administered under environmental temperatures of from 20°C to 55°C, preferably from 25°C to 50°C, most preferably from 30°C to 45°C and/or relative humidities of from 50% to 100%, preferably from 65% to 100%, most preferably from 80% to 100%.

The pantothenic acid and or pantothenic acid precursor or derivative of the compositions useful in the instant invention is preferably present in an amount of from 0.1% to 10%, more preferably from 0.1% to 5%, and most preferably from 0.5% to 3.5%.

Other preferred vitamin compounds useful herein include tocopherol-based anti-oxidant/radical scavengers. Preferred tocopherol-based anti-oxidant/radical scavengers are selected from tocopherol (vitamin E), tocopherol acetate, tocopherol sorbate, other esters of tocopherol, and mixtures thereof. Preferably tocopherol acetate. For example, the use of tocopherol esters including tocopherol acetate in topical compositions and applicable to the present invention is described in U.S. Patent No. 5,786,384.

Preferably the compositions of the present invention comprise from 0.1% to 10%, more preferably from 0.1% to 5%, by weight of the composition of tocopherol-based anti-oxidant/radical scavenger.

(b) Anti-Wrinkle and Anti-Skin Atrophy Actives

Examples of anti-wrinkle and anti-skin atrophy actives that may be used in the compositions of the present invention include, but are not limited to, retinoic acid and its derivatives (e.g., cis and trans); retinol; retinyl esters; niacinamide; sulfur-containing D and L amino acids and their derivatives and salts, particularly the N-acetyl derivatives, a preferred example of which is N-acetyl-L-cysteine; thiols, e.g., ethane thiol; hydroxy acids, phytic acid, lipoic acid; lysophosphatidic acid, and skin peel agents (e.g., phenol and the like).

(c) Antimicrobial and Antifungal Actives

Examples of antimicrobial and antifungal actives that may be used in the compositions of the present invention include, but are not limited to, ß-lactam drugs, quinolone drugs, ciprofloxacin, norfloxacin, tetracycline, erythromycin, amikacin, 2,4,4'-trichloro-2'-hydroxy diphenyl ether, 3,4,4'-trichlorocarbanilide, phenoxyethanol, phenoxy propanol, phenoxyisopropanol, doxycycline, capreomycin, chlorhexidine, chlortetracycline, oxytetracycline, clindamycin, ethambutol, hexamidine isethionate, metronidazole, pentamidine, gentamicin, kanamycin, lineomycin, methacycline, methenamine, minocycline, neomycin, netilmicin, paromomycin, streptomycin, tobramycin, miconazole, tetracycline hydrochloride, erythromycin, zinc erythromycin, erythromycin estolate, erythromycin stearate, amikacin sulfate, doxycycline hydrochloride, capreomycin sulfate, chlorhexidine gluconate, chlorhexidine hydrochloride, chlortetracycline hydrochloride, oxytetracycline hydrochloride, clindamycin hydrochloride, ethambutol hydrochloride, metronidazole hydrochloride, pentamidine hydrochloride, gentamicin sulfate, kanamycin sulfate, lineomycin hydrochloride, methacycline hydrochloride, methenamine hippurate, methenamine mandelate, minocycline hydrochloride, neomycin sulfate, netilmicin sulfate, paromomycin sulfate, streptomycin sulfate, tobramycin sulfate, miconazole hydrochloride, amanfadine hydrochloride, amanfadine sulfate, octopirox, parachlorometa xylenol, nystatin, tolnaftate, zinc pyrithione and clotrimazole.

(d) Sunscreen Actives

The compositions herein may also comprise sunscreen actives. A wide variety of sunscreen agents are useful herein. These sunscreen agents include both organic compounds and their salts as well as inorganic particulate materials. Without being limited by theory, it is believed that sunscreen agents provide protection from ultraviolet radiation by one or more of the following mechanisms including absorption, scattering, and reflection of the ultraviolet radiation. Nonlimiting examples of these sunscreen agents are described in U.S. Patent No. 5,087,445, to Haffey et al., issued February 11, 1992; U.S. Patent No. 5,073,372, to Turner et al., issued December 17, 1991; U.S. Patent No. 5,073,371, to Turner et al. issued December 17, 1991; U.S. Patent No. 5,160,731, to Sabatelli et al., issued November 3, 1992; U.S. Patent No.

5,138,089, to Sabatelli, issued August 11, 1992; U.S. Patent No. 5,041,282, to Sabatelli, issued August 20, 1991; U.S. Patent No. 4,999,186, to Sabatelli et al., issued March 12, 1991; U.S. Patent No. 4,937,370, to Sabatelli, issued June 26, 1990; and Segarin, et al., at Chapter VIII, pages 189 et seq., of Cosmetics Science and Technology. Preferred among the sunscreen agents are those selected from the group consisting of 2-ethylhexyl p-methoxycinnamate, octyl salicylate, octocrylene, oxybenzone, 2-ethylhexyl N,N-dimethylaminobenzoate, p-aminobenzoic acid, 2-phenyl-benzimidazole-5-sulfonic acid, homomenthyl salicylate, DEA p-methoxycinnamate, 4,4'methoxy-t-butyldibenzoylmethane, 4-isopropyldibenzoylmethane, 3-(4-methylbenzylidene) camphor, 3-benzylidene camphor, 4-N,N-dimethylaminobenzoic acid ester with 2,4-dihydroxybenzophenone, 4-N,N-dimethylaminobenzoic acid ester with 2-hydroxy-4-(2-hydroxyethoxy)benzophenone, 4-N,N-dimethylaminobenzoic acid ester with 4-hydroxydibenzoyl- methane, 4-N,N-dimethylaminobenzoic acid ester with 4-(2-hydroxyeth-oxy)dibenzoylmethane, 4-N,N-di(2-ethylhexyl)-aminobenzoic acid ester with 2,4-dihydroxybenzophenone, 4-N,N-di(2-ethylhexyl)aminobenzoic acid ester with 2-hydroxy-4-(2-hydroxyethoxy)benzophenone, 4-N,N-di(2-ethylhexyl)aminobenzoic acid ester with 4-hy-droxydibenzoylmethane, 4-N,N-di(2-ethylhexyl)aminobenzoic acid ester with 4-(2-hydroxyeth-oxy)dibenzoylmethane, 4-N,N-(2-ethylhexyl)methylaminobenzoic acid ester with 2,4-dihydroxybenzophenone, 4-N,N-(2-ethylhexyl)methylaminobenzoic acid ester with 2-hydroxy-4-(2-hydroxyethoxy)benzophenone, 4-N,N-(2-ethylhexyl)methylaminobenzoic acid ester with 4-hy-droxydibenzoylmethane, 4-N,N-(2-ethylhexyl)methylaminobenzoic acid ester with 4-(2-hydroxyeth-oxy)dibenzoylmethane, titanium dioxide, zinc oxide, iron oxide, and mixtures thereof.

More preferred for use in the compositions described herein are the sunscreen agents selected from the group consisting of 2-ethylhexyl N,N-dimethyl-p-aminobenzoate, 2-ethylhexyl p-methoxycinnamate, octocrylene, octyl salicylate, homomenthyl salicylate, p-aminobenzoic acid, oxybenzone, 2-phenylbenzimidazole-5-sulfonic acid, DEA p-methoxycinnamate, 4,4'-methoxy-t-butyldibenzoylmethane, 4-isopropyl dibenzoylmethane, 3-(4-methylbenzylidene) camphor, 3-benzylidene camphor, 4-N,N-(2-ethylhexyl)methylaminobenzoic acid

ester with 4-(2-hydroxyeth-oxy)dibenzoylmethane, titanium dioxide, zinc oxide, iron oxide, and mixtures thereof.

Exact amounts of sunscreens which can be employed will vary depending upon the sunscreen chosen and the desired Sun Protection Factor (SPF) to be achieved. SPF is a commonly used measure of photoprotection of a sunscreen against erythema. See Federal Register, Vol. 43, No. 166, pp. 38206-38269, August 25, 1978.

Polar Solvent

The compositions of the present invention may also comprise polar solvent. Any polar solvent suitable for use in cosmetic compositions may be used herein. However, the polar solvent must be sufficiently polar to drive the formation of vesicles in the present invention. Preferably the polar solvent used in the compositions of the present invention is water.

Preferably comprise the present compositions will comprise from 10% to 90%, more preferably from 20% to 80%, even more preferably from 30% to 60%, by weight, of polar solvent.

Thickeners

The compositions of the present invention preferably comprise thickeners. Any thickener suitable for use in cosmetic compositions can be used herein. Preferred thickeners are selected from nonionic water-soluble polymers, fatty alcohols and mixtures thereof. Suitable nonionic polymers include such water soluble polymers as cellulose ethers (e.g. hydroxybutyl methyl cellulose, hydroxypropylcellulose, hydroxypropyl methyl cellulose, ethylhydroxy ethyl cellulose, hydrophobically modified hydroxyethyl cellulose and hydroxyethylcellulose), poly(ethylene oxide), polyvinyl alcohol, polyvinylpyrrolidone, hydroxypropyl guar gum, amulose, hydroxyethyl amylose, starch, and starch derivatives. Suitable fatty alcohols are higher molecular weight, nonvolatile, primary alcohols having the general formula

RCH2OH

wherein R is a C_{8-20} alkyl. They can be produced from natural fats or oils by reduction of the fatty acid COOH-grouping to the hydroxyl function. Alternatively, identical or similarly structured fatty alcohols can be produced according to conventional synthetic methods known in the art. Suitable fatty alcohols include, but are not limited to behenylalcohol, C_9-C_{11} alcohols, C_{12}-C_{13} alcohols, C_{12}-C_{15} alcohols, C_{12}-C_{16} alcohols, C_{14}-C_{15} alcohols, caprylic alcohol, cetearyl alcohol, coconut alcohol, decyl alcohol, isocetyl alcohol, isostearyl alcohol, lauryl alcohol, oleyl alcohol, palm kernel alcohol, stearyl alcohol, cetyl alcohol, tallow alcohol, tridecyl alcohol or myristyl alcohol.

Other Optional Ingredients

The compositions of the present invention can comprise a wide range of other optional components. These additional components should be pharmaceutically acceptable. Non-limiting examples of functional classes of ingredients suitable for use in the compositions of the present invention include: abrasives, absorbents, anti-acne actives, anticaking agents, anti-dandruff agents, anti-perspirant agents, antioxidants, anti-viral actives, artificial tanning actives and accelerators, biological additives, bleach, bleach activators, brighteners, builders, buffering agents, chelating agents, chemical additives, colorants, cosmetics, cleansers, cosmetic astringents, cosmetic biocides, denaturants, deodorants, desquamation actives, depilatories, drug astringents, dyes, dye transfer agents, enzymes, external analgesics, foam generators, flavours, film formers, fragrance components, insect repellents, mildewcides, non-steroidal anti-inflammatory active, opacifying agents, oxidative dyes, oxidising agents, pest control ingredients, pH adjusters such as citric acid, pH buffers, pharmaceutical actives, plasticizers, preservatives, radical scavengers, skin, hair or nail bleaching agents, skin, hair or nail conditioners, skin, hair or nail penetration enhancers, stabilisers, surfactants, surface conditioners, reducing agents, temperature depressors, viscosity modifiers, and warmth generators such as exothermic zeolites. Also useful herein are aesthetic components such as colourings, essential oils, and skin healing agents. Other optional materials herein include pigments. Pigments suitable for use in the compositions of the present invention can be organic and/or inorganic. Also included within the term pigment are materials having a low colour or lustre such as matte finishing

agents, and also light scattering agents. Examples of suitable pigments are iron oxides, acyglutamate iron oxides, titanium dioxide, ultramarine blue, D&C dyes, carmine, and mixtures thereof.

Formulation Process

Preferably the compositions of the present invention are preferably prepared in such a way that the quaternary ammonium compound forms vesicles. It is preferred that said vesicles also comprise humectant. Preferably said vesicles also comprise emollient. Even more preferably said vesicles comprise thermosensitive skin benefit agents. In order to ensure optimal performance characteristics it is preferred that the compositions of the present invention are prepared as follows:

(i) all or part of the quaternary ammonium agent is mixed with humectant, water soluble thermosensitive skin benefit agents, water soluble skin care actives (where included), and, preferably, polar solvent at a temperature which is higher than the melting point of the quaternary ammonium agent and below the degradation temperature of the thermosensitive skin benefit agent;

(ii) optionally, the mixture is vigorously agitated;

(iii) In a separate vessel the emulsion is prepared as follows;

(iv) The oil phase containing the emollients, the relevant thickener in case the said thickener is oil soluble, oil soluble thermosensitive skin benefit agents and any remaining quaternary ammonium agent are mixed together at a temperature which is higher than the melting point of the quaternary ammonium agent and below the degradation temperature of the thermosensitive skin benefit agent. The aqueous phase is prepared separately. The water, the relevant thickener in case the said thickener is water soluble, and any remaining water soluble ingredients are heated to the same temperature as the oil phase.

(v) the temperature of the oil and aqueous phases of the emulsion are then approximately equalised and the aqueous phase is combined with the oil phase with agitation.

(vi) On production of the emulsion the mixture formed in step (i) is added to the aforementioned emulsion with agitation.

Method of Use

The cosmetic compositions of the present invention may be used in a conventional manner for the treatment of skin. An effective amount of the composition, typically from about 0.1 grams to about 50 grams, preferably from about 1 gram to about 20 grams, is applied to wet or dry, preferably wet, skin. Application of the composition typically includes working the composition into the skin, generally with the hands and fingers. The composition is then left on the skin or, preferably, the skin is rinsed.

The preferred method of treating the skin, therefore, comprises the steps of:

(a) applying an effective amount of the cosmetic composition to the skin,

(b) rinsing the skin.

A preferred aspect of the present invention involves the above method with an application of the composition on dry skin before an application on wet skin. Therefore, a preferred method comprises:

(i) applying to dry skin an effective amount of the cosmetic composition;

(ii) rinsing the skin under a shower;

(iii) further application of said composition; and

(iv) further rinsing.

Much of the damage to human skin is caused by repeated exposure to surfactant containing compositions during washing routines. It has been found that this damage can be mitigated using the present compositions. Therefore, another preferred method comprises:

(i) washing the skin using a composition comprising surfactants;

(ii) rinsing the skin;

(iii) applying to the wet skin a composition according to the present invention;

(iv) rinsing the skin.

It has also been found that the present compositions are particularly useful when incorporated as part of a regular routine. Therefore, another preferred method comprises:

(i) applying to the skin a composition comprising:

(a) at least one quaternary ammonium compound;

(b) humectant; and
(ii) rinsing the skin;
(iii) repeating steps (i) and (ii) within 48 hours.

The present compositions can also be useful in mitigating damage caused by exposure of the skin to ultra violet radiation, damage caused by exposure of the skin to water during swimming or similar water based exercise, damage caused by shaving or exfoliation or damage caused by exposure of the skin to water during bathing.

Examples

The following examples further illustrate the preferred embodiments within the scope of the present invention. The examples are given solely for the purposes of illustration and are not to be construed as limitations of the present invention as many variations of the invention are possible without departing from its spirit or scope. Unless otherwise indicated, all ingredients are expressed on a weight percentage of the active ingredient.

Example	1	2	3	4	5	6	7	8	9	10	11	12	13	
	Weight %													
Quat. Amm. Agt[6]	3	3	3	3	3	3	3	3	3	3	3	3	3	*A*
Glycerine	32	32	32	32	32	32	32	-	-	-	-	-	-	*A*
Urea	-	-	-	-	-	-	-	22	22	22	22	22	22	*A*
Petrolatum	-	-	10	-	12	15	-	-	-	10	-	12	15	*B*
Lanolin [1]	-	-	-	7.5	5	-	15	-	-	-	10	10	-	*B*
Coronet Lanolin [1]	-	-	-	-	-	-	5	-	-	-	-	-	-	*B*
Super Sterol Esters [1]	-	-	-	-	-	-	5	-	-	-	-	-	-	*B*
Sefa Cottonate	21	21	12	12	-	-	-	21	21	12	12	-	-	*B*
Sefa Behenate	-	-	-	-	-	-	-	-	-	-	-	-	-	*B*
Dimethicone 10Cst	-	0.5	0.5	0.5	-	0.5	0.5	0.5	-	-	-	0.5	0.5	*B*
Dimethicone	-	1.0	1.0	1.0	-	1.0	1.0	1.0	-	-	-	1.0	1.0	*B*

1000Cst														
Cyclomethicone	-	2.5	2.5	2.5	-	2.5	2.5	2.5	-	-	-	2.5	2.5	B
Florasun PEG-10 [2]	-	2	-	2	-	3	-	1	-	-	3	-	-	B
Methyl Paraben	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	A
Propyl Paraben	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	B
Disodium EDTA	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	A
Sodium Benzoate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	B
Niacinamide	5	5	3		5	5	5	3	5			5	5	A
Panthenol	3	3	1		3	3	3	1	3			3	3	A
Tocopherol Acetate	2	2	0.5		2	2	2	0.5	2			2	2	B
Parsol 1789 [3]	-	1	-	1	0.5	-	0.1	-	1	-	1	-	1	B
Parsol MCX [3]	-	5	-	5	2.5	-	0.5	-	5	-	5	-	5	B
Citric acid	1	0.5	1	0.5	0.5	1	0.5	1	0.3	0.75	1	1	1	A
Salicylic acid	-	0.5	-	0.5	0.5	-	0.5	-	0.7	-	-	-	-	A
Triethanolamine	0.1	-	-	0.1	0.1	-	-	-	0.1	-	-	0.9	0.5	C
Sodium Hydroxide	-	-	0.1	0.1	0.1	-	-	0.1	-	0.1	-	-	-	C
Polyquaternium 10	-		-	1.0		-	0.5	-	0.6	-	-	-	0.5	B
Polymer KG 30 [4]	-	0.7	-		0.7	-		-	-	0.8	-	-	-	B
Fragrance	0.5	0.5	0.5	0.5	0.5	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	E
Cetyl Alcohol	3	-	-	-	2.6	-	-	2.2	-	2.2	-	2.5	-	C
Stearyl Alcohol	2	-	-	-	1.5	-	-	3.2	-	1.1	-	1.6	-	C
Cetearyl Alcohol	-	-	4	-	0.4	-	-	-	3.4	-	-	-	3.4	C
Behenyl Alcohol	2	-	2	-	-	-	-	0.6	-	0.7	-	-	-	C
Natrosol 330 Plus	1	-	-	-	0.4	-	-	0.7	0.6		-	0.5	0.25	C
Natrosol 250 HHR	-	-	1	-	0.3	-	-	-	-	1.2	-	-	0.3	C
Jaguar HP 105 [5]	-	1.2	-	-	-	-	-	-	-	-	0.8	-	-	D
Jaguar C14S [5]	-	-	-	1	-	-	-	-	-	-	-	-	-	D
Jaguar C13S [5]	-	-	-	-	-	1.2	-	-	-	-	-	-	-	D

Xanthan Gum	-	-	-	-	-	-	2.0	-	-	-	-	-	-	D
Sodium Chloride	-	-	0.1	-	-	-	0.5	0.2	-	0.3	-	-	-	A
Lactic acid	0.5	-	-	-	0.2	-	-	-	-	-	0.05	-	-	A
Retinol	-	-	0.1	-	-	0.1	-	-	-	-	-	0.1	-	B
Retinol Palmitate	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	B
Grape Seed Oil	-	-	-	-	2.8	-	-	-	1.5	-	-	-	-	B
Triciosan	-	0.2	-	-	-	-	-	-	-	-	-	-	0.1	B
Triclocarbanilide	-	-	-	0.2	-	-	-	-	-	0.3	-	-	-	B
Dihydroxyacetone	-	-	-	-	-	-	3	-	-	-	-	-	-	A
Tocopherol	-	-	-	-	-	-	-	-	-	-	2.0	-	-	B
Beta carotene	-	-	-	-	-	-	-	1.2	-	-	-	-	-	B
Vitamin D3	-	-	-	-	-	-	-	-	-	0.2	-	-	1.5	B
Calendula Extract	1.0	-	-	-	-	0.5	-	-	-	-	-	-	-	B
Hydrolysed Wheat Protein	-	-	-	-	-	-	2.8	-	-	-	-	-	-	A
Tetracycline HCl	1	-	-	-	-	-	-	-	-	-	-	0.5	-	A
Minocycline HCl	-	-	2	-	-	-	-	-	-	-	-	-	2	A
Oxytetracycline HCl	-	-	-	-	-	1	-	-	-	2	-	-	-	A
Water	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	A

Example	14	15	16	17	18	19	20	21	22	23	24	25	26	
	Weight %													
Quat. Amm, Agt[6]	8	8	8	8	8	8	8	8	8	8	8	8	8	A
Glycerine	32	32	32	32	32	32	32	-	-	-	-	-	-	A
Urea	-	-	-	-	-	-	-	22	22	22	22	22	22	A
Petrolatum	-	-	10	-	12	15	-	-	-	10	-	12	15	B
Lanolin [1]	-	-	-	7.5	5	-	15	-	-	-	10	10	-	B
Coronet Lanolin [1]	-	-	-	-	-	-	5	-	-	-	-	-	-	B
Super Sterol	-	-	-	-	-	-	5	-	-	-	-	-	-	B

Esters [1]														
Sefa Cottonate	21	21	12	12	-	-	-	21	21	12	12	-	-	B
Sefa Behenate	-	-	-	-	-	-	-	-	-	-	-	-	-	B
Dimethicone 10Cst	-	0.5	0.5	0.5	-	0.5	0.5	0.5	-	-	-	0.5	0.5	B
Dimethicone 1000Cst	-	1.0	1.0	1.0	-	1.0	1.0	1.0	-	-	-	1.0	1.0	B
Cyclomethicone	-	2.5	2.5	2.5	-	2.5	2.5	2.5	-	-	-	2.5	2.5	B
Florasun PEG-10 [2]	-	2	-	2	-	3	-	1	-	-	3	-	-	B
Methyl Paraben	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	A
Propyl Paraben	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	B
Disodium EDTA	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	A
Sodium Benzoate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	B
Niacinamide	5	5	3		5	5	5	3	5			5	5	A
Panthenol	3	3	1		3	3	3	1	3			3	3	A
Tocopherol Acetate	2	2	0.5		2	2	2	0.5	2			2	2	B
Parsol 1789 [3]	-	1	-	1	0.5	-	0.1	-	1	-	1	-	1	B
Parsol MCX [3]	-	5	-	5	2.5	-	0.5	-	5	-	5	-	5	B
Citric acid	1	0.5	1	0.5	0.5	1	0.5	1	0.3	0.75	1	1	1	A
Salicylic acid	-	0.5	-	0.5	0.5	-	0.5	-	0.7	-	-	-	-	A
Triethanolamine	0.1	-	-	0.1	0.1	-	-	-	0.1	-	-	0.9	0.5	C
Sodium Hydroxide	-	-	0.1	0.1	0.1	-	-	0.1	-	0.1	-	-	-	C
Polyquaternium	-		-	1.		-	0.5	-	0.6	-	-	-	0.5	B

10				0										
Polymer KG 30 [4]	-	0.7	-		0.7	-		-	-	0.8	-	-	-	B
Fragrance	0.5	0.5	0.5	0.5	0.5	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	E
Cetyl Alcohol	3	-	-	-	2.6	-	-	2.2	-	2.2	-	2.5	-	C
Stearyl Alcohol	2	-	-	-	1.5	-	-	3.2	-	1.1	-	1.6	-	C
Cetearyl Alcohol	-	-	4	-	0.4	-	-	-	3.4	-	-	-	3.4	C
Behenyl Alcohol	2	-	2	-	-	-	-	0.6	-	0.7	-	-	-	C
Natrosol 330 Plus	1	-	-	-	0.4	-	-	0.7	0.6		-	0.5	0.2	C
Natrosol 250 HHR	-	-	1	-	0.3	-	-	-	-	1.2	-	-	0.3	C
Jaguar HP 105 [5]	-	1.2	-	-	-	-	-	-	-	-	0.8	-	-	D
Jaguar C14S [5]	-	-	-	1	-	-	-	-	-	-	-	-	-	D
Jaguar C13S [5]	-	-	-	-	-	1.2	-	-	-	-	-	-	-	D
Xanthan Gum	-	-	-	-	-	-	2.0	-	-	-	-	-	-	D
Sodium Chloride	-	-	0.1	-	-	-	0.5	0.2	-	0.3	-	-	-	A
Lactic acid	0.5	-	-	-	0.2	-	-	-	-	-	0.1	-	-	A
Retinol	-	-	0.1	-	-	0.1	-	-	-	-	-	0.1	-	B
Retinol Palmitate	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	B
Grape Seed Oil	-	-	-	-	2.8	-	-	-	1.5	-	-	-	-	B
Triclosan	-	0.2	-	-	-	-	-	-	-	-	-	-	0.1	B
Triclocarbanilide	-	-	-	0.2	-	-	-	-	-	0.3	-	-	-	B
Dihydroxyacetone	-	-	-	-	-	-	3	-	-	-	-	-	-	A
Tocopherol	-	-	-	-	-	-	-	-	-	-	2.0	-	-	B
Beta carotene	-	-	-	-	-	-	-	1.2	-	-	-	-	-	B
Vitamin D3	-	-	-	-	-	-	-	-	-	0.2	-	-	1.5	B
Calendula Extract	1.0	-	-	-	-	0.5	-	-	-	-	-	-	-	B
Hydrolysed Wheat Protein	-	-	-	-	-	-	2.8	-	-	-	-	-	-	A
Tetracycline HCl	1	-	-	-	-	-	-	-	-	-	-	0.5	-	A
Minocycline HCl	-	-	2	-	-	-	-	-	-	-	-	-	2	A
Oxytetracycline	-	-	-	-	-	1	-	-	-	2	-	-	-	A

HCl														
Water	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	A

Example	27	28	29	30	31	32	33	34	35	
	Weight %									
Quat. Amm, Agt[6]	3	3	3	3	3	3	3	3	3	A
Glycerine	15	16	9	9	8	9	-	32	32	A
Propylene Glycol	-	16	-	-	-	5	12	-	-	A
Butylene Glycol	-	-	8	8	-	8	12	-	-	A
Urea	-	-	-	12	-	2	9	-	-	A
Petrolatum	-	-	10	-	12	15	-	-	4	B
Lanolin [1]	-	-	-	7.5	7.5	-	15	-	3.5	B
Coronet Lanolin [1]	-	-	-	-	-	-	-	-	7	B
Super Sterol Esters [1]	-	-	-	-	-	-	-	-	3.5	B
Isohexadecane	-	-	-	-	-	-	-	-	-	B
Isononyl Isononanoate	-	-	-	-	-	-	-	-	-	B
Sefa Cottonate	21	21	12	12	-	-	-	13	-	B
Sefa Behenate	-	-	-	-	-	-	-	9	-	B
Dimethicone 10Cst	-	0.5	0.5	0.5	-	0.5	0.5	0.5	-	B
Dimethicone 1000Cst	-	1.0	1.0	1.0	-	1.0	1.0	1.0	-	B
Cyclomethicone	-	2.5	2.5	2.5	-	2.5	2.5	2.5	-	B
Florasun PEG-10 [2]	-	2	-	2	-	3	-	1	-	B
Methyl Paraben	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	A
Propyl Paraben	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	B
Disodium EDTA	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	A
Sodium Benzoate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	B
Niacinamide	3	5	5			5	5	5	3	A

Panthenol	1	3	3			3	3	3	1	A
Tocopherol Acetate	0.5	2	2			2	2	2	0.5	B
Parsol 1789 [3]	-	1	-	1	0.5	-	1	-	1	B
Parsol MCX [3]	-	5	-	5	2.5	-	5	-	5	B
Citric acid	1	0.5	1	0.5	0.5	1	0.5	1	0.3	A
Salicylic acid	-	0.5	-	0.5	0.5	-	0.5	-	0.7	A
Triethanolamine	0.1	-	-	0.1	0.1	-	-	-	0.1	C
Sodium Hydroxide	-	-	0.1	0.1	0.1	-	-	0.1	-	C
Polyquaternium 10	-	-	-	1.0	-	-	0.5	-	0.6	B
Polymer KG 30 [4]	-	0.7	-	-	0.7	-	-	-	-	B
Fragrance	0.5	0.5	0.5	0.5	0.5	-	0.5	0.5	0.5	E
Cetyl Alcohol	3	-	-	-	2.6	-	-	2.2	-	C
Stearyl Alcohol	2	-	-	-	1.5	-	-	3.2	-	C
Cetearyl Alcohol	-	-	4	-	0.4	-	-	-	3.4	C
Behenyl Alcohol	2	-	2	-	-	-	-	0.6	-	C
Natrosol 330 Plus	1	-		-	0.4	-	-	0.7	0.6	C
Natrosol 250 HHR	-	-	1	-	0.3	-	-	-	-	C
Jaguar HP 105 [5]	-	1.2	-	-	-	-	-	-	-	D
Jaguar C14S [5]	-	-	-	1	-	-	-	-	-	D
Jaguar C13S [5]	-	-	-	-	-	1.2	-	-	-	D
Xanthan Gum	-	-	-	-	-	-	3.0	-	-	D
Sodium Chloride	-	-	0.1	-	-	-	0.5	0.2	-	A
Lactic Acid	0.5	-	-	0.2	-	-	-	-	-	A
Retinol	-	-	0.1	-	-	0.05	-	-	-	B
Retinol Palmitate	0.1	-	-	0.05	-	-	-	-	-	B
Grape Seed Oil	-	-	-	-	2.8	-	-	-	1.5	B
Triclosan	-	0.25	-	-	-	-	-	-	-	B
Triclocarbanilide	-	-	-	0.2	-	-	-	-	-	B
Dihydroxyacetone	-	-	-	-	-	-	3	-	-	A
Tocopherol	-	-	-	-	-	-	-	-	-	B
Beta Carotene	-	-	-	-	-	-	-	1.25	-	B
Vitamin D3	-	-	-	-	-	-	-	-	-	B

Calendula Extract	1.0	-	-	-	-	0.5	-	-	-	B
Hydrolysed Wheat Protein	-	-	-	-	-	-	2.8	-	-	A
Tetracycline HCl	1	-	-	-	-	-	-	-	-	A
Minocycline HCl	-	-	2	-	-	-	-	-	-	A
Oxytetracycline HCl	-	-	-	-	-	1	-	-	-	A
Water	qs	qs	qs	qs	qs	qs	qs	qs	qs	A

Example	36	37	38	39	40	41	
	Weight %						
Quat. Amm. Agt[6]	3	3	3	3	3	3	A
Glycerine	32	32	32	32	32	32	A
Propylene Glycol	-	-	-	-	-	-	A
Butylene Glycol	-	-	-	-	-	-	A
Urea	-	-	-	-	-	-	A
Petrolatum	7.5	-	12	5	-	6	B
Lanolin [1]	-	3	-	-	-	-	B
Coronet Lanolin [1]	-	6.7	-	-	6	-	B
Super Sterol Esters [1]	-	6.5	-	3	6	3	B
Isohexadecane	5	-	3	-	-	3	B
Isononyl Isononanoate	3	-	5	-	-	-	B
Sefa Cottonate	8	-	-	8	12	10	B
Sefa Behenate	-	5	-	5	-	-	B
Dimethicone 10Cst	-	-	0.5	0.5	-	-	B
Dimethicone 1000Cst	-	-	1.0	1.0	-	-	B
Cyclomethicone	-	-	2.5	2.5	-	-	B
Florasun PEG-10 [2]	-	3	-	-	2.5	-	B
Methyl Paraben	0.5	0.5	0.5	0.5	0.5	0.5	A

Propyl Paraben	0.5	0.5	0.5	0.5	0.5	0.5	B
Disodium EDTA	0.1	0.1	0.1	0.1	0.1	0.1	A
Sodium Benzoate	0.3	0.3	0.3	0.3	0.3	0.3	B
Niacinamide	3		5	5	5	3	A
Panthenol	1		3	3	3	1	A
Tocopherol Acetate	0.5		2	2	2	0.5	B
Parsol 1789 [3]	-	1	-	0.1	1	-	B
Parsol MCX [3]	-	5	-	0.5	5	-	B
Citric acid	0.75	1	1	1	1	-	A
Salicylic acid	-	-	-	-	-	0.5	A
Triethanolamine	-	-	0.9	0.5	-	-	C
Sodium Hydroxide	0.1	-	-	-	-	0.6	C
Polyquaternium 10	-	-	-	0.5	1.0	-	B
Polymer KG 30 [4]	0.8	-	-	-	-	0.8	B
Fragrance	0.5	0.5	0.5	0.5	0.5	0.5	E
Cetyl Alcohol	2.2	-	2.5	-	-	3.2	C
Stearyl Alcohol	1.1	-	1.6	-	-	2.6	C
Cetearyl Alcohol	-	-	-	3.4	-	-	C
Behenyl Alcohol	0.7	-	-	-	-	0.2	C
Natrosol 330 Plus		-	0.5	0.25	-	0.6	C
Natrosol 250 HHR	1.2	-	-	0.3	-	-	C
Jaguar HP 105 [5]	-	0.8	-	-	-	-	D
Jaguar C14S [5]	-	-	-	-	-	-	D
Jaguar C13S [5]	-	-	-	-	0.8	-	D
Xanthan Gum	-	-	-	-	-	-	D
Sodium Chloride	0.3	-	-	-	0.2	0.1	A
Lactic Acid	0.05	-	-	-	-	-	A
Retinol	-	-	0.1	-	-	-	B
Retinol Palmitate	-	-	-	-	-	-	B
Grape Seed Oil	-	-	-	-	-	-	B
Triclosan	-	-	-	0.1	-	-	B
Triclocarbanilide	0.3	-	-	-	-	-	B
Dihydroxyacetone	-	-	-	-	-	-	A
Tocopherol	-	2.0	-	-	-	-	B

Beta Carotene	-	-	-	-	-	-	B
Vitamin D3	0.2	-	-	-	-	-	B
Calendula Extract	-	-	-	-	-	-	B
Hydrolysed Wheat Protein	-	-	-	-	1.7	-	A
Tetracycline HCl	-	-	0.5	-	-	-	A
Minocycline HCl	-	-	-	-	-	2	A
Oxytetracycline HCl	2	-	-	-	-	-	A
Water	qs	qs	qs	qs	qs	qs	A

Example	42	43	44	45	46	47	48	49	50	51	
	Weight %										
Quat. Amm, Agt[6]	8	8	8	8	8	8	8	8	8	8	A
Glycerine	15	16	9	9	8	9	-	32	32	32	A
Propylene Glycol	-	16	-	-	-	5	12	-	-	-	A
Butylene Glycol	-	-	8	8	-	8	12	-	-	-	A
Urea	-	-	-	12	-	2	9	-	-	-	A
Petrolatum	-	-	10	-	12	15	-	-	4	7.5	B
Lanolin [1]	-	-	-	7.5	7.5	-	15	-	3.5	-	B
Coronet Lanolin [1]	-	-	-	-	-	-	-	-	7	-	B
Super Sterol Esters [1]	-	-	-	-	-	-	-	-	3.5	-	B
Isohexadecane	-	-	-	-	-	-	-	-	-	5	B
Isononyl Isononanoate	-	-	-	-	-	-	-	-	-	3	B
Sefa Cottonate	21	21	12	12	-	-	-	13	-	8	B
Sefa Behenate	-	-	-	-	-	-	-	9	-	-	B
Dimethicone 10Cst	-	0.5	0.5	0.5	-	0.5	0.5	0.5	-	-	B
Dimethicone 1000Cst	-	1.0	1.0	1.0	-	1.0	1.0	1.0	-	-	B
Cyclomethicone	-	2.5	2.5	2.5	-	2.5	2.5	2.5	-	-	B
Florasun PEG-10	-	2	-	2	-	3	-	1	-	-	B

[2]											
Methyl Paraben	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	A
Propyl Paraben	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	B
Disodium EDTA	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	A
Sodium Benzoate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	B
Niacinamide	3	5	5			5	5	5	3	3	A
Panthenol	1	3	3			3	3	3	1	1	A
Tocopherol Acetate	0.5	2	2			2	2	2	0.5	0.5	B
Parsol 1789 [3]	-	1	-	1	0.5	-	1	-	1	-	B
Parsol MCX [3]	-	5	-	5	2.5	-	5	-	5	-	B
Citric acid	1	0.5	1	0.5	0.5	1	0.5	1	0.3	0.75	A
Salicylic acid	-	0.5	-	0.5	0.5	-	0.5	-	0.7	-	A
Triethanolamine	0.1	-	-	0.1	0.1	-	-	-	0.1	-	C
Sodium Hydroxide	-	-	0.1	0.1	0.1	-	-	0.1	-	0.1	C
Polyquaternium 10	-	-	-	1.0	-	-	0.5	-	0.6	-	B
Polymer KG 30 [4]	-	0.7	-	-	0.7	-	-	-	-	0.8	B
Fragrance	0.5	0.5	0.5	0.5	0.5	-	0.5	0.5	0.5	0.5	E
Cetyl Alcohol	3	-	-	-	2.6	-	-	2.2	-	2.2	C
Stearyl Alcohol	2	-	-	-	1.5	-	-	3.2	-	1.1	C
Cetearyl Alcohol	-	-	4	-	0.4	-	-	-	3.4	-	C
Behenyl Alcohol	2	-	2	-	-	-	-	0.6	-	0.7	C
Natrosol 330 Plus	1	-		-	0.4	-	-	0.7	0.6		C
Natrosol 250 HHR	-	-	1	-	0.3	-	-	-	-	1.2	C
Jaguar HP 105 [5]	-	1.2	-	-	-	-	-	-	-	-	D
Jaguar C14S [5]	-	-	-	1	-	-	-	-	-	-	D
Jaguar C13S [5]	-	-	-	-	-	1.2	-	-	-	-	D
Xanthan Gum	-	-	-	-	-	-	3.0	-	-	-	D
Sodium Chloride	-	-	0.1	-	-	-	0.5	0.2	-	0.3	A
Lactic Acid	0.5	-	-	0.2	-	-	-	-	-	0.05	A
Retinol	-	-	0.1	-	-	0.1	-	-	-	-	B
Retinol Palmitate	0.1	-	-	0.1	-	-	-	-	-	-	B
Grape Seed Oil	-	-	-	-	2.8	-	-	-	1.5	-	B

Triclosan	-	0.2	-	-	-	-	-	-	-	-	B
Triclocarbanilide	-	-	-	0.2	-	-	-	-	-	0.3	B
Dihydroxyacetone	-	-	-	-	-	-	3	-	-	-	A
Tocopherol	-	-	-	-	-	-	-	-	-	-	B
Beta Carotene	-	-	-	-	-	-	-	1.2	-	-	B
Vitamin D3	-	-	-	-	-	-	-	-	-	0.2	B
Calendula Extract	1.0	-	-	-	-	0.5	-	-	-	-	B
Hydrolysed Wheat Protein	-	-	-	-	-	-	2.8	-	-	-	A
Tetracycline HCl	1	-	-	-	-	-	-	-	-	-	A
Minocycline HCl	-	-	2	-	-	-	-	-	-	-	A
Oxytetracycline HCl	-	-	-	-	-	1	-	-	-	2	A
Water	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	A

1; Available from Croda
2; Available from Floratech, AZ, USA
3: Available from Hoffman La Roche, NJ, USA
4; Available from Amerchol, NJ, USA
5; Available from Rhodia, NJ, USA
6; The quaternary ammonium compound used is N,N-di(canolyl-oxy-ethyl)-N methyl,N-(2-hydroxyethyl)Ammonium Methyl Sulfate supplied by Goldschmidt, trade name Rewoquat V3620.

Process

For those examples including component C:

1. **Premix 1:** Combine components of group A together at a temperature greater than the transition temperature of the chosen quaternary ammonium compound, keeping back a predetermined part of the quaternary ammonium compound and water. Vigorously agitate this premix.
2. **Premix 2:** Combine components of groups B and C with the remaining parts of the quaternary ammonium compounds and water not previously used in premix 1. Heat above the melting point of the quat and the oils.
3. Combine Premix 1 & 2 and allow to cool until 40°C, stir in the perfume.

For those examples including component D:

1. **Premix 1:** Combine components of group A together at a temperature greater than the transition temperature of the chosen quaternary ammonium compound, keeping back a predetermined part of the water. Vigorously agitate this premix.
2. **Premix 2:** Combine with agitation the components of group D with the water not previously used in premix 1.
3. Combine Premix 1 & 2 and components of groups B & E. Vigorously agitate.

The compositions of the above examples provide good skin care benefits, such as good moisturisation, good hydration, good skin feel, good skin softness and/or good skin smoothness, with low levels of negatives such as greasiness, stickiness or tack.

Claims

1. A cosmetic composition comprising:
   (a) at least one quaternary ammonium agent having a transition temperature of less than 50°C
   (b) at least one thermosensitive skin benefit agent.

2. A composition according to Claim 1 wherein the composition comprises 0.01%, more preferably at least 1%, by weight, of quaternary ammonium agent.

3. A composition according to Claim 1 or 2 wherein the composition comprises at least 0.01%, preferably at least 0.5%, by weight of thermosensitive skin benefit agent.

4. A composition according to any of the preceding claims wherein the thermosensitive skin benefit agent is selected from compounds that begin to decompose upon heating to above 50°C.

5. A composition according to any of the preceding claims wherein the thermosensitive skin benefit agent is selected from vitamin A and derivatives; salicylic acid; tocopherol, β-carotene, vitamin D_3; urea and mixtures thereof.

6. A composition according to any of the preceding claims wherein the compositions comprise vesicles, said vesicles comprising quaternary ammonium agent and thermosensitive skin benefit agent.

7. A composition according to any of the preceding claims wherein the quaternary ammonium agent is selected from N,N-di(canolyl-oxy-ethyl)-N,N-dimethyl ammonium chloride, N,N- di(canolyl-oxy-ethyl)-N-methyl,N-(2-hydroxyethyl) ammonium methyl sulfate, N,N-di(canolyl-oxy-ethyl)-N-methyl, N-(2-hydroxyethyl) ammonium chloride and mixtures thereof.

8. A composition according to any of the preceding claims wherein composition additionally comprises a humectant.

9. A composition according to any of the preceding claims wherein composition additionally comprises an emollient.

10. Use of a composition according to any of the preceding claims for the treatment of skin.

INTERNATIONAL SEARCH REPORT

Int. ..tional Application No
PCT/US 00/17636

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61K7/50 A61K7/00 A61K7/48

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
WPI Data, PAJ, EPO-Internal, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 804 205 A (EPSTEIN ET AL.) 8 September 1998 (1998-09-08) cited in the application claims 1-4; table 1	1-6,8-10
Y	---	7
Y	WO 97 39733 A (THE PROCTER & GAMBLE COMPANY) 30 October 1997 (1997-10-30) example 1 page 19, line 19 - line 29 page 9, line 27 page 5, line 33 -page 8, line 34	7

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 October 2000	26/10/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Alvarez Alvarez, C

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INTERNATIONAL SEARCH REPORT

Int. tional Application No
PCT/US 00/17636

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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